

*ANTECHINUS SWAINSONII* (WATERHOUSE, 1840), THE DUSKY MARSUPIAL  
MOUSE, AN ADDITION TO THE MAMMAL FAUNA OF QUEENSLAND

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ABSTRACT

Six *A. swainsonii* collected from a variety of vegetation types (elevation 780-1000 m) within Lamington National Park and two National Parks on the Springbrook Plateau between 1966 and 1975 are the first specimens to be recorded from Queensland. Aspects of behaviour and physiology suggest the possibility of a male die-off after a July-August breeding.

*Antechinus swainsonii* has been recorded from Tasmania, South Australia, Victoria and New South Wales. The most northerly record (Australian Museum) is from the Guy Fawkes district (30° 25' S, 152° 20' E) near Armidale, New South Wales. Calaby (1970) notes that *A. swainsonii* was not found in the upper Richmond and Clarence Rivers region although suitable habitat occurs there.

Four adult males from Lamington National Park, an adult female from Warrie National Park and a juvenile male from National Park 752 Numinbah, collected between 1966 and 1975, are the first records from Queensland. Five are registered in the collection of the Queensland Museum (JM834-6, JM1594-5) and one is lodged in the collections of the National Parks and Wildlife Service (registration number N11506).

Lamington National Park (19,851 ha) in the south east corner of Queensland encloses a section of the McPherson Range and adjacent northern spur ranges. Vegetation types present include rainforest, beech forest, wet sclerophyll forest, open eucalypt forest and mallee heath. Average annual rainfall is 1525-1650 mm.

Warrie National Park (624 ha) lies partly on the Springbrook Plateau and also encloses the headwaters of the East Branch of Little Nerang Creek. The Nimmel Range forms the eastern boundary of the Park. Vegetation types include rainforest, wet sclerophyll forest, open eucalypt forest and patches of secondary forest resulting

from logging or clearing prior to National Park gazettal.

National Park 752 Numinbah (198.7 ha) encloses a narrow strip of land along the McPherson Range at the southern end of the Springbrook Plateau. The Park extends into Numinbah Valley. Rainforest, antarctic beech forest and secondary forest are represented in the Park. Average annual rainfall on the Springbrook Plateau is 3821 mm.

Cranial, dental and external measurements of adult males are presented in Table 1 and are taken as shown in Archer (1976). Wet measurements were taken from JM835 and N11506. Although our sample size is small, comparison of mean dimensions of the four adult male Queensland specimens with mean dimensions of three adult males from the Guy Fawkes district (Australian Museum specimens M8344, M6007 and Queensland Museum specimen J3809) suggests that the Queensland males are equal to or larger than the north New South Wales males in all measurements taken.

Wet measurements in mm for female (JM1595) and juvenile male (JM1594) are as follows: Basical length 22.4, 22.5 respectively; zygomatic width 16.2; —; outside bullae width 12.5, 10.3; inside bullae width 4.4, 3.1; C<sup>1</sup>-M<sup>4</sup> 12.7, —; M<sup>1-4</sup> 6.9, —; M<sup>1-3</sup> 5.8, —; R-LM<sup>3</sup> 9.5, —; minimal interorbital width 7.9, 6.8; inter-palatal vacuity distance 4.3, —; dentary length 24.0, 17.8; I<sub>1</sub>-M<sub>4</sub> 13.9, —; M<sub>1-4</sub> 7.6, —; M<sub>1-3</sub> 5.9, —; condyle to angular process 5.9, 4.7; condyle to anterior border of ascending ramus 5.5, 4.3; hindfoot (without

TABLE 1: COMPARATIVE MEASUREMENTS OF QUEENSLAND AND GUY FAWKES ADULT MALE *Antechinus swainsonii* (IN MILLIMETRES)

Measurement	Queensland specimens					Guy Fawkes specimens			
	JM835	JM836	JM834	N11506	Means	M8344	M6007	J3809	Means
Basicranial length	33.6	34.0	33.0	—	33.5	34.0	29.6	30.7	31.4
Zygomatic width	18.6	19.3	19.4	19.5	19.2	20.0	17.2	17.2	18.1
Outside bullae width	13.1	13.2	13.4	13.7	13.3	12.7	—	12.8	12.7
Inside bullae width	4.6	4.7	4.9	5.0	4.8	5.3	—	4.3	4.8
C <sup>1</sup> - M <sup>4</sup>	13.4	13.5	13.7	14.0	13.6	13.5	12.7	13.0	13.1
M <sup>1-4</sup>	7.4	7.4	7.3	7.8	7.5	7.1	7.1	7.5	7.2
M <sup>1-3</sup>	6.2	6.2	6.1	6.5	6.2	6.3	6.0	6.4	6.2
R - LM <sup>3</sup>	10.1	10.1	10.5	10.0	10.2	10.4	9.8	10.0	10.1
Minimal interorbital width	7.9	8.5	8.1	8.1	8.1	8.0	8.0	8.4	8.1
Inter-palatal vacuity distance	4.1	4.7	4.7	5.1	4.6	3.4	3.1	3.9	3.5
Dentary length	27.5	27.1	26.1	28.0	27.2	27.3	23.4	24.2	25.0
I <sub>1</sub> - M <sub>4</sub>	16.1	15.3	14.8	16.0	15.5	16.1	14.7	15.2	15.3
M <sup>1-4</sup>	7.7	7.8	7.8	8.1	7.8	7.9	7.7	8.3	8.0
M <sup>1-3</sup>	5.9	6.3	6.0	6.3	6.1	6.3	5.7	6.0	6.0
Condyle to angular process	6.4	6.6	6.6	7.1	6.7	7.2	6.1	5.6	6.3
Condyle to ant. border of ascending ramus	6.7	7.0	6.8	7.0	6.9	7.4	6.3	6.5	6.7
Hind foot (without claws)	23	24	24	25	24.0	24	23	23	23.3
Tail-vent	130	129	131	141	132.7	106	124	95	108.3
Head-body	142	137	145	—	141.3	158	99	131	129.3
Total length	272	266	276	—	271.3	264	223	226	237.7
Ear (from notch)	19	18	18	19	18.5	17	17	—	17.0
Weight (g)	—	—	120	—	120.0	90	—	—	90.0

claws) 20.0, 14.8; tail-vent 94.2, 54.3; head-body 111.2, 60.3; total length 205.4, 114.6; ear (from notch) 16.1, 10.0.

JM836 was trapped (PO) 3 August 1966, in a Perske wire trap (39 × 20 × 16 cm) baited with bacon, in a region of the park known as Dave's Creek Country (28° 13' S, 153° 12' E; elevation 900 m). This is an area of mountain mallee heath, approximately 162 ha in extent, developed on soils derived from rhyolite. It is surrounded by rainforest and wet sclerophyll forest. A prominent trachyte dyke known as Surprise Rock outcrops near the capture site. Plant species present include *Leptospermum lanigerum*, *L. flavescens*, *Banksia collina*, *Leucopogon melaleucoides*, *Callistemon montanus*, *Lepidosperma canescens* and *Eucalyptus codonocarpa* (mallee). Jones (1964) provides a detailed description of the floristics and physical characteristics of the region. The abrupt change from rainforest to mallee heath is closely associated with edaphic factors. At the capture site the heath was dense and formed a continuous canopy. Isolated *E. codonocarpa* emerged to a height of 6–7 m. A ground layer of herbs and sedges was present.

JM835 was trapped (SVD) in rainforest near Binna Burra Lodge (28° 12' S, 153° 11' E; elevation 780 m) in an Elliott collapsible aluminium trap (33 × 10 × 9 cm) on 5 August 1974. The trap was located between the buttress roots of a large fig (probably *Ficus watkinsiana*) adjacent to the road at the Park entrance. The specimen died after two days in captivity. This patch of rain forest contains a number of mature eucalypts (*Eucalyptus microcorys*, *E. grandis*, *E. saligna*, *E. acmenoides*) and brush box (*Tristania conferta*) which suggests that the area was previously wet sclerophyll forest, rainforest species having established probably as a result of changes in the fire regime. A ground cover of ferns is present.

JM834 was captured by hand (SVD) on 26 July 1975, approximately 1 km northwest of O'Reilly's Guest House (28° 13' S, 153° 7' E; elevation 900 m). It was observed at 10.00 a.m. scurrying in the leaf litter of a stand of regenerating rainforest in which the dominant species was *Rhodomlyrtus psidioides*. It ran into a burrow (approximately 75 cm long and 7 cm in diameter), constructed amongst the roots of a sapling and ending blindly in an unlined chamber approximately 7 cm below ground level. This individual was maintained in Brisbane until its death in early October 1975 (Plate 20). Two weeks after capture its urine was found to contain abundant spermatozoa.

N11506 was found dead on a Park walking track by Mrs M. Masson 27 July 1975 approximately 3 km southeast of O'Reilly's Guest House (28° 15' S,

153° 9' E; elevation 1000 m) in mature rainforest. The body had been chewed in half, one foreleg and portion of the abdomen having apparently been eaten by an unknown predator and the head and hind quarters abandoned. The head was brought back by Mrs Masson and the hind quarters collected by one of us the following day. A predator could have carried the specimen some distance to the place where it was finally found. Both dingoes (*Canis familiaris dingo*) and tiger cats (*Dasyurus maculatus*) are present in the area.

JM1594 (juvenile with dP4) was found dead by K. Bade (a National Parks and Wildlife Service officer) on 25 December 1968 in a small patch of antarctic beech (*Nothofagus moorei*) within National Park 752 (28° 14' S, 153° 16' E), elevation 1000 m).

JM1595 was found dead by K. McDonald (another officer of the N.P.W.S.) on a graded walking track, 80 metres south of the point at which the track branches to The Canyon and Twin Falls, in Warrie National Park, approximately 400 m from the park headquarters (28° 13' S, 153° 16' E, elevation 780 m) on 2 May 1971. The collection site was immediately adjacent to an area of tall layered open forest dominated by blue mountain ash (*Eucalyptus oreades*) and New England ash (*E. andrewsii*); associated with these is a dense understory of *Callicoma seratifolia*, a re-growth species whose presence is probably a direct result of earlier logging activities in the area. An area of *Leptospermum* sp. and sedges nearby was also recorded by the collector.

*A. swainsonii* inhabits rain forest, wet sclerophyll forest, alpine woodlands and heaths (Ride 1970). Wakefield and Warneke (1963) describe some of these habitat types in more detail and record captures from mountainous areas down to sea level. Green (1972) records *A. swainsonii* in Tasmania from beech dominated rainforest and adjacent ecotones; specimens were taken at altitudes ranging from 1000 m to sea level. In southeast New South Wales (Nadgee Nature Reserve) Newsome (1975) obtained high trap captures of *A. swainsonii* in upland heath (elevation 500 m); it was also taken from lowland swamps.

The four Lamington specimens were found in a variety of vegetation types—tall closed-forest (rainforest), closed-forest (regenerating rainforest) and closed-heath (Specht et al. 1974). In each case the projective area of ground covered by the foliage of dominant plants was greater than 70%. This also appears to be the case in habitats described by others for this species. The closed-forest types offer abundant litter and rotting logs. Elevation of capture sites ranges from 780 m to 1000 m. In view

of the extensive trapping carried out by one of us (PO) in the National Park during 1966–67 resulting in only one capture of *A. swainsonii*, it would appear that this species either is trap shy, excluded from traps by other species (cf. Newsome 1975), occurs in localised areas of suitable habitat (cf. Wakefield and Warneke 1963), or some combination of these.

There are insufficient details about the habitat types for the two Springbrook specimens. If JM1594 came from the *Callicoma* regrowth area, this would not appear to conflict with a proposal that *A. swainsonii* is associated with a closed canopy, although it does suggest that this canopy need not necessarily be formed by the dominant vegetative layer. JM1594 was collected in closed-forest (antarctic beech forest). Both collection sites lie within the elevation range of the Lamington captures and average annual rainfall is well in excess of that recorded for Lamington.

In captivity JM834 ate one or two day-old chicken carcasses each night. These were grasped in the mouth, lifted high in the air and bashed from side to side on rocks and the cage sides before being eaten. Burrows were constructed in grass and other plant material supplied on the cage floor. Wakefield and Warneke (1963) note similar burrow construction for *A. swainsonii*.

Later, when placed in a smaller cage containing an exercise wheel, JM834 wore the pads from all its feet and ground off its incisors. After a month it became suddenly moribund, developed an inflamed condition on the left flank, lost flank fur, and died. Ground down incisors, heavily worn pads and loss of flank fur occur in male *Antechinus flavipes* just before death during late September in the Beerwah region (P. Dwyer pers. comm.).

Wakefield and Warneke (1963) found in Victoria that *A. swainsonii* breeds during a restricted period in late winter. In June the testes are at maximum size and the pouch area becomes enlarged in late July. Size of the testes was used as the only external indication of sexual maturity in males. Green (1972) found the Tasmanian subspecies to breed later, and over a more extended period. Newsome (1975) records breeding in Nadgee as starting mid-July.

Considering the combination of deaths in captivity; spermatozoa in the urine, diurnal wanderings, capture of sexually mature males at the same time of the year, and the collection of juvenile JM1594, it is tempting to suggest a yearly breeding cycle and male die-off similar to but a month prior to that proposed by Wood (1970) for *Antechinus stuartii* which also occurs in the capture areas.

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